Supporting Documentation for Surface Fire Behavior, IFT-surface (based on the SURFACE module in BehavePlus)

Name of Software Tool: IFT-surface

Current Version Description/Date: IFT-surface version 01-31-12

Software Code and History: The mathematical code for IFT-surface is from the Fire Behavior Software Developer Kit (FBSDK) and the BehavePlus5 xfblib.cpp and xfblib.h. IFT-surface (01-31-12) implements a critical subset of the model functionality found in the BehavePlus-SURFACE module. Details comparing the functionality of BehavePlus5 and equivalent tools in IFTDSS can be found in Drury et al. (2012, BehavePlus Functionality available in IFTDSS Version 1.0). Rigorous testing has been performed to verify that the mathematical output from the IFT-surface module is consistent with the output from the BehavePlus5-SURFACE module. Details concerning the output evaluation between the BehavePlus-SURFACE and IFT-surface modules can be found in PDF files included in the IFTDSS online help (under **IFTDSS Compared with Other Systems > Module Test Cases)**. Future versions of IFTDSS are scheduled to expand the BehavePlus functionality.

Software Developer(s) Names, Organization, and Contact Information:

- BehavePlus was developed by U.S. Forest Service, Rocky Mountain Research Station, Fire, Fuel, and Smoke Science Program. Contact information is available on: http://www.firemodels.org/index.php/behaveplus-support/behaveplus-contact-us
- IFT-surface was developed by the IFTDSS Development Team based on software libraries provided by the BehavePlus developers. The IFTDSS Development Team may be contacted using the Feedback function available on every page of IFTDSS.

Science Module Contact, Names, Organization, and Contact Information:

- Contact information for implementation of the surface fire behavior models in the SURFACE module in BehavePlus or the underlying scientific algorithms is available on: http://www.firemodels.org/index.php/behaveplus-support/behaveplus-contact-us
- For questions regarding IFT-surface, please contact the IFTDSS Team using the Feedback Function available on every page of IFTDSS.

Availability of the Version of Record: The latest version of the software code for IFT-surface resides with Sonoma Technology, Inc. (STI) and is being used in IFTDSS version 1.0. However, STI did not develop the scientific algorithms within the software code. The IFT-surface software module code is public domain and available from STI upon written request.

Primary Funding Sources:

- BehavePlus development and support has been funded by U.S. Forest Service, Rocky Mountain Research Station, Fire, Fuel, and Smoke Science Program; U.S. Forest Service, Fire and Aviation Management; the Joint Fire Science Program (JFSP).
- IFT-surface development was funded by JFSP.

Application Purpose (General): The IFT-surface module is used to calculate fire behavior characteristics such as rate of spread, fireline intensity, flame length, spread direction, and spread distance for head, backing, and flanking fires. IFT-surface can be used to model fire behavior for Element 7 (Fire Behavior Prescription) of the burn plan, and can be used to facilitate in decision making for other Elements of the burn plan.

Application Purpose (Fuel Treatment): IFT-surface can be used to predict fire behavior pre- and post-fuels treatments.

User/Application Documentation:

- Documentation of BehavePlus operation and application: http://www.firemodels.org/index.php/national-systems/behaveplus

User Application Guidance:

- The IFTDSS online help includes a PDF tutorial that illustrates how to use IFTDSS to prepare a burn plan (*Preparing a Prescribed Burn Plan*).

Scientific Foundations of the Software Tool:

- Degree of validation/evaluation and availability of written results:
  No information available at this time.
- Publications describing BehavePlus and the fire models on which it is based:
  http://www.firemodels.org/index.php/behaveplus-introduction/behaveplus-publications

Training Availability:

- Training on BehavePlus can be found at:
  http://www.firemodels.org/index.php/behaveplus-support/behaveplus-training